

NOTES ON FISHES COLLECTED BY DAVID S. JORDAN AT CEDAR KEYS, FLORIDA.

By DAVID S. JORDAN and JOSEPH SWAIN.

In the month of November, 1883, two days were spent at Cedar Keys, Fla., by Professor Jordan, in making collections of fishes. The seine was drawn on the sand-flats in the harbor, and the catches of the seine fishermen along the shore, and of the hook-and-line fishermen in deeper water were examined. The fauna appears to differ in no important respect from that of Pensacola. Cedar Keys are a little farther south, and hence species of *Malthe* and *Gerres* are more abundant than at Pensacola, while *Diplodus holbrooki*, unknown at the latter point, is here a common food-fish. We are indebted to Mr. A. Bettelini, fish-dealer at Cedar Keys, for numerous specimens.

1. *Pristis pectinatus* Latham. *Sawfish*. Rather common.

2. *Clupea pensacolæ* (Goode & Bean) Jordan.

Color in life light-greenish above, a yellow shade above opercle and humeral region, and on snout above; sides of back with three or four bronze streaks along middle of rows of scales, the one along the lower dark row most conspicuous; iris and lower jaw gilt; sides of head iridescent; dorsal and caudal fins yellowish and dotted with darker; other fins translucent; no opercular spot.

The genus *Harengula* seems to us not tenable. *Cl. sardina* Poey, a near ally of *Cl. pensacola*, has the scales formed much as in the latter, but as readily deciduous as in the other herrings.

3. *Stolephorus browni* (Gmelin) Jordan & Gilbert.

Three specimens, each with the anal rays i, 20.

4. *Synodus fætens* (Linnaeus) Gill.

Several specimens taken with the seine.

5. *Fundulus similis* (Baird & Girard) Günther.

Common.

6. *Fundulus heteroclitus grandis* Baird & Girard.

Common. We have compared the specimens taken at Cedar Keys with examples of the true *heteroclitus* from Wood's Holl, Mass.; the former have the body more robust, the fins and back darker, and the light spots of body and fins larger and paler. The scales on top of head are usually larger in the specimens from Cedar Keys. The fins are scarcely lower than in the true *heteroclitus*. In some specimens the dorsal is $1\frac{4}{5}$ in head and anal $1\frac{1}{2}$ in head. As these characters are more or less variable, *grandis* should probably be considered as a Gulf form of *F. heteroclitus*, a subspecies rather than a species.

7. Hemirhamphus unifasciatus Rauzani.

Abundant; taken with the seine.

8. Tylosurus marinus (Bloch & Schneider) Jordan & Gilbert.

Abundant in the harbor; taken with the seine.

9. Siphostoma affine (Günther) Jordan & Gilbert.

A single specimen 3 inches in length. Color of body in spirits plain light olive, there being no spots on back; caudal fin dusky; other fins plain olive. A dark horizontal streak on snout and eye. Rings 16 + 31. Dorsal covering 3 + 5 rings. The body of this specimen is more slender than is common in this species, giving it the appearance of *S. louisiana*. Two specimens from Key West present the same appearance and characters.

10. Mugil albula Linnaeus. *Mullet*.

Common. The most abundant food-fish at Cedar Keys, at least in November, which is near its spawning time.

11. Menidia vagrans (Goode & Bean) Jordan & Gilbert.

Common in the shallows of the harbor. In these specimens the number of anal rays varies from i, 15 to i, 18, thus differing from *M. laciniata* of the South Atlantic coast, which has the anal rays i, 19 to i, 21.

12. Menidia peninsulæ (Goode & Bean) Jordan & Gilbert.

Common, with the preceding. The specimens taken are unusually large for this species.

13. Oligoplites saurus (Bloch & Schneider) Jordan & Gilbert.

(*Chorinemus occidentalis* * Cuv. & Val.)

One specimen taken with the seine.

14. Trachynotus carolinus (Linnaeus) Gill. *Pompano*.

Common; the most highly-valued food-fish at Cedar Keys.

15. Caranx hippos (Linnaeus) Günther. *Jack*.

Not rare.

16. Serranus atrarius (Linnaeus) Jordan & Gilbert. *Blackfish*.

Common.

* We have rejected the Linnaean name *occidentalis* for this species, not finding any evidence that the original *Gasterosteus occidentalis* of the *Systema Naturæ*, x. p. 295, was this fish. The later reference of the figure of *Oligoplites* in Brown's *Jamaica* to the synonymy of "*Gasterosteus occidentalis*," does not prove that the specimen in the Museum de Geer was an *Oligoplites*.

The following is the original account, which is both incorrect and insufficient:

"*Occidentalis* 3, G. spinis dorsalibus septem, spinisque duabus ante pinnam analem, D. 7, 11; P. 7; V. 6; A. 2, $\frac{1}{7}$; C. 16. *Habitat in America. Mus. De Geer.*"

The earliest name clearly belonging to this fish is that of *Scomber saurus* Bl. & Schn., based on the figure of Brown.

17. *Epinephelus morio* (Cuvier) Gill. *Red Grouper*.

Common in deep water; taken with hook and line on the snapper banks.

18. *Epinephelus stomias* (Goode & Bean) Jordan. *Gag*.

With the preceding, but rather less common. Grows to a much larger size than *E. morio*. From Cedar Keys southward the name "Gag," is universal for this species, the name "Black Grouper" being given to *E. brunneus* (Poey).

19. *Calamus arctifrons* Goode & Bean.

One young specimen taken in the seine.

In life this specimen was silvery, bluish or iridescent above, the centers of many of the scales pearly, especially above and between the spots. A row of about six rather faint salmon-olive spots along lateral line. Above these, below base of dorsal, a row of faint large diffuse blotches of the same color, and below the first series a series of faint smutty tinges, making the whole form a series of obscure and broken cross-bars. Preorbital pale salmon color with a few faint vermicular streaks. A light blue streak along lower side of eye and extending obliquely forward. Interorbital space yellowish, preceded by bluish lines. Both dorsals and anal marked with small spots of dusky salmon color; similar spots forming undulating cross-bars on caudal. Ventrals bluish-white, faintly barred. Pectorals pale.

20. *Lutjanus caballerote* (Bloch & Schneider) Poey. *Gray Snapper; Lawyer; Mangrove Snapper*.

Common. The young about the shores are called gray snapper or Lawyer, and have been wrongly identified by authors with *Lutjanus caxis*, a species not known from farther north than Key West.

21. *Lutjanus campechianus* Poey. *Red Snapper (Lutjanus blackfordi* Goode & Bean).22. *Pomadasys chrysopterus* (L.) Goode & Bean* MSS. *Pigfish. (Pristipoma fulvomaculatum* and *P. fasciatum*, C. & V.)

Common, taken in the seine.

23. *Hæmulon plumieri* (La Cépède). *Grunt*.

Not very common.

24. *Diplodus probatocephalus* (Walbaum) Jordan & Gilbert. *Sheep's-head*.

Abundant; one of the most valued of the "bottom-fish," *i. e.*, fish taken in the seine.

25. *Diplodus holbrooki* (Bean) Jordan & Gilbert. *Sailors' Choice*.

Color in life, silvery, slightly bluish above; top of head and the preorbital tinged with yellowish; a faint orange blotch under junction of spinous and soft rays of dorsal; a deep orange blotch on and under

*We are informed by Dr. Bean that the Linnæan type of *Perca chrysoptera* examined by him in London belongs to *Pomadasys fulvomaculatus*.

last rays of dorsal; a large blackish blotch on caudal peduncle above and extending down its side to anal. Soft dorsal and anal margined with dusky; axil slightly dusky. Ventrals dusky bluish. Pectorals pale. Edge of opercular flap, dusky. Rather common; considered a good food-fish.

26. *Diplodus rhomboides* (Linnaeus) Jordan & Gilbert.

Very common.

27. *Pogonias chromis* (Linnaeus) Cuvier & Valenciennes. *Drum.*

Rather common.

28. *Sciæna chrysuræ* (La Cépède) Jordan & Gilbert.

A few seen.

29. *Sciæna ocellata* (Linnaeus) Jordan & Gilbert. *Red Bass.*

Common. One of the most abundant food-fish, as elsewhere on the Gulf coast. Like other Sciænoids, this species abounds in sandy bays at no great depth.

30. *Liostomus xanthurus* La Cépède

Not abundant.

31. *Cynoscion maculatum* (Mitchill) Gill. *Sea Trout.*

An abundant and valuable food-fish.

32. *Gerres gula* Cuvier & Valenciennes.

Extremely abundant on shallow beaches. The synonymy of this species given by Evermann and Meek (Proc. Ac. Nat. Sci., Phila., 1882) appears to be fully justified.

33. *Gerres lefroyi* (Goode) Günther.

A single specimen obtained; the most northern record of this species.

34. *Prionotus tribulus* Cuvier & Valenciennes.

One young specimen.

35. *Batrachus tau* (Linnaeus) Cuvier & Valenciennes. *Toadfish.*

Common about the wharves.

36. *Paralichthys albigutta* Jordan & Gilbert. *Flounder.*

The commonest of the flounders at Cedar Keys. Several specimens taken larger than any of the original types. The largest of these (14½ inches long) has been sent to the National Museum. (No. 35085.)

Color in life grayish, obscurely blotched with darker, and finely marbled with different shades. Sides with several dark ocelli, larger than eye, and bounded by pale outlines. The whole head and body with round creamy spots, smaller than pupil, nearly equally distributed and irregularly mingled with finer dots. Fins colored like body, but paler and more reddish-brown. The *young* are rather more faintly marked.

It has been suggested that the type of *Citharichthys microstomus* Gill (Proc. Ac. Nat. Sci., Phila. 1864, 223) is *Etropus crossotus* rather than *Citharichthys spilopterus*, to which species it has been referred by Jordan & Gilbert (Syn. Fish N. A., p. 817). The fin rays and scales agree fairly with either, but the statements that the height enters $2\frac{3}{4}$ times in the extreme length, and that the mouth is "rather small" (for a *Citharichthys*), show that Dr. Gill's fish could not have been an *Etropus*.

37. *Aphoristia plagiusa* (Linnaeus) Jordan & Gilbert.

One specimen taken.

38. *Paralichthys ommatus* Jordan & Gilbert.

Rather common.

39. *Etropus crossotus* Jordan & Gilbert.

Four specimens of this species, each with about 42 scales in the lateral line, and 76 developed rays in the dorsal fin. The type of this species from Mazatlan had 48 scales in the lateral line, and 80 rays in the dorsal. The specimens from Cedar Keys have the body rather deeper than those from Mazatlan, $1\frac{3}{4}$ in total length without caudal. We are not, however, prepared to consider the Atlantic fish as a distinct species.

40. *Malthe vespertilio* (Linnaeus) Cuvier.

Very abundant on the sandy bottoms in the harbor. Among the eighteen specimens of this species brought from Cedar Keys the forms known as *Malthe cubifrons* and *Malthe nasuta* (*notata*; *truncata*), both occur. The characters, however, upon which these species have been separated from *M. vespertilio* are so variable that we can consider them as of individual value only, and we refer both *eubifrons* and *nasuta* to the synonymy of *M. vespertilio*. The form of the rostral process varies in these specimens from that of a button-like tubercle, not projecting beyond the snout, to a long conical process, one-tenth the length of the fish to base of caudal. All intermediate forms and lengths are found among these specimens. The rostral process appears to become shorter with age, but there are exceptions to this rule. The width of the head between anterior angles of orbits is usually greater in the specimens with button-like rostral process. The height of the rostral cavity is greater than the width in all our specimens from Cedar Keys, but a fish from Egmont Key, which is evidently not specifically different, has this cavity broader than high. The round black spots on the back are conspicuous in life, but they grow fainter, and sometimes disappear, in spirits. The belly in life is of a coppery red.

41. *Tetrodon nephelus* Goode & Bean.

A single specimen was obtained. It has no prickles anywhere on the body, but otherwise is not evidently different from *T. nephelus*. Many similar specimens, as well as others prickly in various degrees, have been since obtained by Professor Jordan at Key West.

INDIANA UNIVERSITY, January 25, 1884.